DOCUMENT RESUME

ED 196 908 SP 017 404

AUTHOR Brideau, Linda B.; Allen, Vernon L.
TITLE Individual Differences in Nonverbal Communication: Facial and Vocal Encoding Skills. Report from the Project on Studies of Instructional Programming for the Individual Student.
INSTITUTION Wisconsin Univ., Madison. Research and Development Center for Individualized Schooling.
SPONS AGENCY National Inst. of Education (DHEW), Washington, D.C.
REPORT NO WRDCIS-TR-567
PUB DATE Nov 80
GRANT OB-NIE-G-80-0117
NOTE 39p.

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Body Image; Body Language; College Students; *Communication Skills; *Interpersonal Attraction; *Nonverbal Communication; Peer Acceptance; *Peer Evaluation; Sex Differences; Socialization

ABSTRACT

This study tested the hypothesis that physical attractiveness is related to social skills in nonverbal communication. The socialization environment of persons is assumed to differ as a function of their physical attractiveness. It was predicted that physically attractive individuals would have greater opportunity than physically unattractive individuals to develop nonverbal communication skills (encoding ability). Results showed that physically attractive females had greater nonverbal communication skills than unattractive females in two nonverbal channels (facial and vocal). Males did not differ in communication accuracy (facial or vocal) as a function of level of physical attractiveness. The interaction between physical attractiveness and sex of encoder is consistent with research suggesting that attractiveness contributes strongly to social acceptance and self concept for females, but less so for males. (Authors/CJ)

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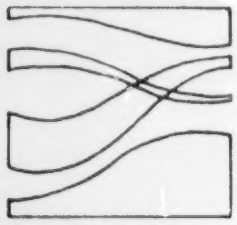

Technical Report No. 567

Individual Differences in Nonverbal Communication: Facial and Vocal Encoding Skills

by Linda B. Brideau and Vernon L. Allen

U.S. DEPARTMENT OF HEALTH
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SP 017 004

November 1980

Wisconsin Research and Development
Center for Individualized Schooling

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by

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Report from the Project on
Studies of Instructional Programming for the Individual Student

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November 1980

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FEB 2 1981

Published by the Wisconsin Research and Development Center for Individualized Schooling. The project presented or reported herein was performed pursuant to a grant from the National Institute of Education, Department of Health, Education, and Welfare. However, the opinions expressed herein do not necessarily reflect the position or policy of the National Institute of Education, and no official endorsement by the National Institute of Education should be inferred.

Center Grant No. OB-NIE-G-80-0117

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The Wisconsin Research and Development Center is supported with funds from the National Institute of Education and the University of Wisconsin.

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Abstract

The present study tested the hypothesis that physical attractiveness is related to social skills in nonverbal communication. The socialization environment of persons is assumed to differ as a function of their physical attractiveness. We predicted, on the basis of these differences, that the physically attractive would have greater opportunity than physically unattractive individuals to develop nonverbal communication skills (encoding ability). Results showed that physically attractive females had greater nonverbal communication skills than unattractive females in two nonverbal channels (facial and vocal). Males did not differ in communication accuracy (facial or vocal) as a function of level of physical attractiveness. The interaction between physical attractiveness and sex of encoder is consistent with research suggesting that attractiveness contributes strongly to social acceptance and self-concept for females, but less so for males.

Children involved in tutoring programs accrue multiple benefits from their experience. In addition to academic gains, children often show improvements in their social skills. This effect could be a consequence of increasing the frequency of interaction for less popular children. Two social skills that should benefit from increased interaction with others are the ability to produce (encode) and to interpret (decode) nonverbal cues. Although verbal ability is taught directly in formal settings, nonverbal skills are shaped through interaction with others by subtle positive and negative feedback and through observational learning. One consequence of this incidental learning of nonverbal communication is a large range of individual differences in the ability to encode and decode nonverbal behavior. Within a tutoring context it is important to identify those children who have difficulty with nonverbal communication. These children will stand to make the greatest gains in social skills but may need extra training and closer supervision. To aid in identifying these children it is important to delineate individual variables correlated with nonverbal fluency. The present paper reviews past research and presents a study that examined physical attractiveness as a predictor of nonverbal skills.

Sex differences in nonverbal behavior are prevalent in nonverbal research. However, such differences seem more associated with encoding than decoding skills. Buck and his colleagues (Buck, 1975; Buck, 1977; Buck, Miller, & Caul, 1974; Buck, Savin, Miller, & Caul, 1972) have systematically examined sex differences for encoding and decoding nonverbal behavior. In one study, Buck et al. (1972) found that communication accuracy was higher for female encoding and decoding pairs than for male

pairs. In this study, it was not possible to determine whether the sex difference was due to encoding or decoding ability. Therefore, another study was conducted in which both sex of encoder and decoder were varied (Buck et al., 1974). Results showed that the female superiority in the earlier study was due to encoding ability: No sex differences were found for sex of decoder. Two other studies examined sex differences in children's ability to encode affect (Buck, 1975; 1977). Results showed that girls and boys did not differ in their encoding ability. After integrating the four studies, Buck suggests that sex differences in adults are due to socialization practices that result in males inhibiting their expression of emotion. He further suggests that a developmental study of this question would help in determining the age at which sex differences begin to appear.

Hall (1978) recently provided an extensive review of sex differences in nonverbal decoding ability. She concluded that the majority of studies showed females to be more accurate than males in decoding nonverbal behavior. This apparent inconsistency with Buck's findings may be due to differences in the nonverbal channel under investigation. Hall's review is consistent if one focuses on decoding ability for facial expressions (Buck's research focus)--only 20% of these studies found significant effects for sex of decoder.

Age is a second characteristic expected to correlate with skills in nonverbal communication. There is a surprising lack of research on the developmental trends in the ability to encode and decode nonverbal cues. Buck (1975) demonstrated that children are able to encode and decode facial

expressions of positive and negative affect at better than chance level. Even very young children (preschoolers) were able to express and detect affect by nonverbal behavior. Buck (1977) also found that the correlation between age and encoding ability was positive for girls but negative for boys. This finding supported his hypothesis that boys are socialized to inhibit expressions of emotion. This result is somewhat tentative, however, in view of the limited age range examined (4 to 6 years).

The most extensive developmental study was conducted by Gates (1923), who examined the ability of children, age 3 to 14, to decode facial expressions of emotion. Results showed a clear trend for greater decoding ability with increasing age. Unlike Buck's (1977) finding of a difference for sex across ages with encoding, Gates found that both girls and boys showed similar increases in decoding ability with increase in age.

As in many other areas of psychology, researchers have turned to the examination of personality variables as a potential explanation of individual differences. Unfortunately, findings in this area have not been consistent. For children (Buck, 1975), a significant positive relationship has been found between the ability to encode affect and teachers' ratings on six quasi-personality characteristics (activity level, expression of hostility, bossiness, impulsivity, number of school friends, and extraversion). In addition, encoding ability was negatively related to cooperation, shyness, and solitary play. Buck (1977) examined the underlying dimensions of teachers' ratings as potential correlates of encoding ability. The results of a factor analysis identified three factors: (a) expressive-inhibited, (b) antagonistic-cooperative, and (c) independent dependent.

Boys' encoding ability correlated positively with the expressive factor, and girls' encoding ability correlated positively with the antagonistic factor. These results suggest an alternative explanation of the relations obtained. It is possible that teachers may have labeled differently the same behaviors when exhibited by boys and girls. For example, active play by boys may have been seen as expressive, but labeled as antagonistic when exhibited by girls. This study points to the need for objective measures of personality.

For adults, the relation of personality to encoding and decoding ability has been mixed. Nonverbal encoding skills were positively correlated with extraversion, self-esteem, and anxiety (Buck et al., 1974; Cunningham, 1977; Zuckerman, Hall, DeFrank, & Rosenthal, 1976). In contrast, Thompson and Meltzer (1964) found no reliable correlations between the 18 subscales of the California Personality Inventory and encoding ability. Drag and Shaw (196[illegible]) also failed to find a significant correlation between encoding ability and situational anxiety.

What can be concluded about the relation between decoding ability and personality? Of five personality measures examined by Cunningham (1977), only neuroticism was positively correlated with decoding ability. Using the Bell Adjustment Inventory, Fields (1953) found a positive correlation between decoding accuracy and social adjustment, but not for emotional adjustment. Zuckerman et al. (1976) did not find significant correlations between decoding ability and three measures of personality (self-monitoring, facilitation-inhibition, and anxiety-reactivity). Thus, it is apparent that attempts to account for individual differences in terms of personality traits have met with little success.

The present study investigated the relationship between physical attractiveness and nonverbal skills. Our main hypothesis was that physically attractive individuals show greater skill in nonverbal communication than unattractive persons. This hypothesis is based on recent research in social psychology that examines physical attractiveness as an important factor in interpersonal interaction (e.g., Adams, 1977; Berscheid & Walster, 1974). Findings from this research suggest that the socialization environment for attractive and unattractive individuals may be quite different.

First, researchers have shown a positive relationship between physical attractiveness and popularity for both children and adults (e.g., Dion & Berscheid, 1974; Walster, Aronson, Abrahams, & Rottman, 1966). This suggests that physically attractive individuals have more opportunities to interact with others. Based on this supposition, one would expect superior nonverbal skills for physically attractive individuals.

A second finding in physical attractiveness research suggests that the quality of interaction may also vary with attractiveness. Subjects in a study by Snyder, Tanke, and Berscheid (1977) behaved differently in a phone conversation with target individuals depending on the perceived attractiveness of the other. Furthermore, the target's behavior was also influenced by the perceiver's expectations. Target individuals were warmer, friendlier, and more sociable when interacting with perceivers who thought they were attractive rather than unattractive. Thus, one can speculate that persons interacting with physically attractive individuals may behave in such a way as to elicit more expressive behavior. Thus, the physically attractive may have more opportunities to practice encoding nonverbal cues.

Third, a recent study suggests that individuals may produce more nonverbal cues in the presence of physically attractive than unattractive persons. Kleck and Rubenstein (1975) found that subjects gazed and smiled more in the presence of an attractive rather than an unattractive confederate. Since only two nonverbal behaviors were measured, these results are limited. However, one could speculate that nonverbal decoding opportunities may also be greater for physically attractive than unattractive individuals.

Finally, additional support for the present hypothesis is provided by Goldman and Lewis (1977). In their study, judges rated the level of social skills displayed by individuals engaged in a telephone conversation. Results showed that social skills were positively correlated with physical attractiveness. This study shows a direct relationship between physical attractiveness and social skills, but the finding is severely limited by the method used to operationalize social skills. Judges gave their subjective impressions of each person's social skills; no objective measures were employed. Therefore, it is not possible to determine the criteria judges employed in rating the subjects' social skills.

The present study investigated a specific social skill, namely, the ability to encode nonverbal expressions of emotion. We predict that physically attractive subjects will be more accurate encoders of nonverbal behavior than physically unattractive subjects. This hypothesis is tested for two nonverbal channels--facial and vocal (noncontent aspects of speech). For both channels, we expect encoding accuracy to be higher for those who are physically attractive than those who are unattractive.

Method

Encoding Phase

Stimulus persons. The stimulus persons used for encoding were 9 male and 10 female undergraduate students from the University of Wisconsin. They were solicited during the registration period for summer session, and were paid $2.50 for their participation in the study.

Apparatus. The stimulus persons were videotaped with a Panasonic videotape camera (model WR-340P) and a Sony videotape player (model 3650) while seated on a couch approximately 8 m from the camera. The zoom lens of the camera was adjusted to provide a close-up view of the encoder's face and shoulders. The encoder's voice was recorded on a Sony (model TC 353) tape recorder.

Procedure. Each person used for the encoding participated individually in an experimental session. The stimulus person was met by a female experimenter and taken to the experimental room. After the stimulus person was seated, the experimenter explained that the study was concerned with a person's ability to express emotions. The stimulus person was told that he or she would be asked to display five emotions--fear, anger, sadness, happiness, and disgust. It was further explained that each of these emotions would be expressed at three intensity levels--slight, moderate, and extreme. Encoders were told to express the emotions by means of facial expressions while intoning standard sentences that would be provided. The standard sentences were: "I feel yov men dos about what happened today. It was a nim cey experience." Nonsense syllables were used instead of the appropriate words to express the five emotions

(e.g., I feel sad . . ., I feel happy . . ., etc.) to avoid the possibility of lip reading by decoders during the second phase of the study. It was explained that while saying the standard sentences the stimulus persons should try to convey the emotion both by facial expressions and tone of voice. Following the instructions, each stimulus person was given a consent form to read. The form obtained their agreement to participate in the study, to be videotaped, and to allow the tapes to be shown to observers. All persons agreed to the details specified in the consent form. After agreeing to be in the study, the encoders were given a practice session to familiarize them with the procedure and the standard sentences.

Prior to each experimental session, a random order of presenting the intensity of each emotion was prepared. In other words, the three levels of intensity were encoded sequentially, but were not ordered by magnitude (slight, moderate, extreme); instead, the progression of the intensity level was randomly selected from the six combinations possible.

Videotaping began when the encoder had finished the practice session. Prior to each taping segment the encoder was told which emotion to express and the intensity of the emotion. The videotape player was turned on when the encoder was ready and videotaping proceeded for approximately 7 seconds. This procedure was repeated for each tape segment. At the end of the session subjects were debriefed, paid, and thanked for their participation in the study.

Physical Attractiveness Ratings

Judges. The judges were five male and five female undergraduates at the University of Wisconsin. Experimental credits were awarded for their participation in the study.

Apparatus. Still pictures of each encoder were presented to the judges by means of a closed-circuit television system that consisted of a Sony videotape recorder (model 3650) and a RCA Lyceum 66-cm studio monitor (model JR345B). The judges were seated at a table approximately 10 m from the monitor, and dividers separated them to insure independent judgments.

Stimulus tape. Still pictures of the encoders were edited from the videotapes during the encoding phase. The still picture was edited from videotapes of the stimulus person prior to encoding emotion. Thus, the facial expressions were essentially neutral.

Procedure. The judges were brought to the experimental room and were read the following instructions.

> Today you will be shown still pictures of 9 male and 10 female adults. These pictures will be presented on the monitor at the front of the room. You will be asked to rate the physical attractiveness of each person shown. The picture will be presented for 5 seconds. When the picture goes to snow, you should record your judgment in the response booklet provided. The response booklet consists of 19 pages, 1 for each judgment. The scale provided consists of a solid line with the ends labeled, extremely unattractive to the left and extremely attractive to the right. To indicate your judgment, place a slash through

the line corresponding to your judgment of physical attractiveness. Imagine the line as a continuum of physical attractiveness on a scale from 0 to 100. If you decide that the person is unattractive, you should put a slash through the line towards the left end. If you think the person is attractive, then the slash should be put towards the right end of the line. I would like you to give your honest opinion in making your judgments; that is, try to give an objective assessment of the physical attractiveness of each person shown. There will be a 10-second gap between each picture. During this time, record your judgment, then turn to the next page so that you will be ready for the next segment. Since we would like independent judgments please do not talk during the session. Are there any questions?

Following these instructions the judges were shown the still pictures and made their ratings of physical attractiveness. At the end of the session the judges were debriefed and given experimental credit for their participation in the study.

Decoding Phase: Facial Channel

Subjects. The observers who served as decoders were 30 male and 30 female undergraduates enrolled in an introductory psychology course. All subjects received experimental credits for their participation. Each stimulus tape was viewed by 10 males and 10 females.

Apparatus. The stimulus tapes were presented to the observers by means of a closed-circuit television system that consisted of a Sony video-

tape recorder (model 3650) and a RCA Lyceum 66-cm studio monitor (model JR345B). The decoders were seated at a table approximately 10 m from the monitor, and dividers separated the decoders to ensure independent judgments.

Stimulus tapes. The original tapes from the encoding phase consisted of 15 tape segments for each of the 19 encoders (5 emotions x 3 intensity levels). Three stimulus tapes were prepared for presentation to decoders: One tape presented emotions expressed at the slight intensity level, one presented emotions expressed at the moderate intensity level, and one for emotions at the extreme intensity level. All 19 stimulus persons appeared on each stimulus tape, and each of them displayed all five emotions. The videotape segments (95) were randomly ordered on the stimulus tapes.

Procedure. The decoders were brought to the experimental room by a female experimenter who read the following instructions to them:

> Today I am going to show you a number of videotape segments of students from an earlier study. These students were videotaped while expressing five emotions. Your task will be to identify the emotion in a given tape segment. The tapes you will see is a sample of the original tapes. The order of the stimulus persons and emotions have been randomized. After viewing a tape segment, I will ask you to indicate what emotion you think the person was conveying. It will be one of five emotions; either fear, anger, sadness, happiness, or disgust. I will now explain in more detail the procedure we will be following. First, a videotape segment of a student

will be shown on the monitor at the front of the room. It will last approximately 6 seconds. You should watch carefully and try to decide what emotion the student is conveying. At the end of the tape segment the picture will go to snow. At this point you should give your answer. Even if you decide on the emotion early in the film you should watch the full tape segment before responding. Now look at the response booklet in front of you. To indicate your choice of emotion, merely place a checkmark in front of the emotion you have chosen. After making your response, turn the page of your booklet so that you will be ready for the next tape segment. There will be a 10-second break between each tape segment to give you time to answer. You should be able to respond within this time period. However, at the beginning it may take a bit longer since you will be unfamiliar with the procedure. Therefore, I will stop the videotape if you find you need additional time. Please make responses to all segments. If you are unsure, you should guess what emotion the person is conveying. In addition, it is important to remember that the segments are in no particular order. Therefore, make each decision independent of the other decisions you have made. Are there any questions before we begin?

The decoders were provided with response booklets to record their answers. A page was provided for each videotape segment. Each page consisted of the following question: "Which of the following emotions do

you think the person in the film segment was conveying? Indicate your choice by a checkmark." Alternatives were fear, anger, sadness, happiness, and disgust. After viewing all of the stimulus tapes the decoders were debriefed and given experimental credits for their participation in the study.

Decoding Phase: Vocal Channel

Subjects. The decoders were 27 male and 27 female undergraduates at the University of Wisconsin. They were given experimental credits for their participation in the study. Each stimulus tape was decoded by 9 male and 9 female subjects.

Apparatus. The tape recordings of the encoders were played on a Sony (model TC 353) tape recorder. The observers were seated at a table with wooden dividers to insure independent judgments.

Stimulus tapes. Analogous to the preparation of the videotapes, three audio stimulus tapes were prepared for presentation to the decoders--one tape for slight intensity, one tape for moderate intensity, and one tape for extreme intensity. The order of presentation for emotions was randomly determined across encoders. Thus, each tape consisted of 95 audio segments (19 encoders x 5 emotions).

Procedure. When the decoders were brought to the experimental room and seated, the experimenter read the following instructions:

> Today I am going to play tape recordings of students who participated in an earlier study. These students were asked to convey a number of emotions by their tone of voice. They

were asked to express these emotions while saying two standard sentences. In order for the sentences to be applicable to all the emotions, nonsense syllables were used at a number of key points in these sentences. The sentences were: "I feel yoy men dos about what happened today. It was a nim cey experience."

Your task today is to listen to the way the students say these sentences and to try to identify the emotion being conveyed. The emotion will be one of five; fear, anger, sadness, happiness, or disgust. Each tape segment will last for approximately 6 seconds. Listen carefully to the person's voice as he or she speaks. At the end of the recording there will be a 5-second period of silence to give you time to record your decision. Even if you think you have identified the emotion early in the recording, please listen to the full tape segment before you put down your response. The tape is in no particular order: Therefore, you should make each judgment independent of previous judgments. When you have recorded your decision, turn the page of your booklet so that you will be ready for the next tape segment. The tape should take approximately 20 minutes to play. Are there any questions before we begin?

Following the completion of the tape the subjects were debriefed and given experimental credits for participating.

Method of Analysis

The data for the facial and vocal channels were coded for decoders' accuracy of determining the emotion expressed. For each segment a "1"

was assigned if the decoder correctly identified the emotion intended by the encoder, and a "0" was assigned if the decoder did not correctly identify the emotion intended by the encoder. For example, if the encoder tried to produce facial expressions for happiness a "1" would be given if, after viewing this segment, the decoder indicated this emotion (happiness).

To test the effect of physical attractiveness the sample of encoders was divided at the median into high attractive and low attractive groups. For males, this resulted in four high and four low attractive subjects: For females, this resulted in five high and five low attractive subjects. The data employed in the analyses were the percent of encoders correctly decoded for the high and low attractive groups. The scores could vary from 0 to 100, where a score of 0 indicates that none of the encoders were correctly decoded and a 100 indicates that all encoders were decoded correctly.

Results

Facial Channel Accuracy

A preliminary analysis of variance showed no significant main effect nor interaction for sex of decoder; therefore, this variable was collapsed for the final analysis. The data were analyzed by a 3 (intensity of emotion) x 2 (sex of encoder) x 2 (physical attractiveness) x 5 (emotion) mixed analysis of variance. Intensity of emotion was the only between-subjects variable.

Table 1 indicates that the predicted main effect for physical attractiveness was significant, F (1, 57) = 81.85, $p < .001$; high attractive encoders communicated more accurately than low attractive encoders. However, encoders' physical attractiveness did interact with the sex of encoder, F (1, 57) = 81.85, $p < .001$. Table 2 indicates that females who rated high on physical attractiveness were decoded more accurately than females who rated low on physical attractiveness. But for male encoders, the decoding accuracy for low attractive males did not differ significantly from high attractive males. Thus, the finding of superior encoding by high attractive stimulus persons was specific to females.

A three-way interaction between physical attractiveness, sex of encoder, and emotion indicated that the attractiveness effect was more pronounced for encoding certain emotions, F (4, 228) = 23.72, $p < .001$. In the case of female encoders, all means were in the predicted direction (i.e., high attractive was more accurate than low attractive): Tukey's HSD was significant for anger, sadness, and happiness, but not for fear and disgust. In contrast, results for male encoders were less consistent. Means for the males showed that high attractive encoders were more accurate than low attractive encoders for fear, sadness, and disgust, but these differences did not attain significance. Significant differences for physical attractiveness were found for anger and happiness, but opposite from the predicted direction--low attractive males were decoded more accurately than high attractive males.

A number of findings independent of physical attractiveness were obtained in the analysis. A main effect was obtained for intensity and for

Table 1

Analysis of Variance for Facial Channel Accuracy

Source	df	MS	F
Intensity of emotion (A)	2	41,250.81	76.29***
S/A	57	540.74	
Sex of encoder (B)	1	51,182.13	82.82***
A x B	2	2,834.33	4.59*
SB/A	57	618.02	
Physical attractiveness (C)	1	11,976.40	28.35***
A x C	2	704.69	1.67
SC/A	57	422.46	
B x C	1	24,561.69	81.85***
A x B x C	2	359.04	7.96
SBC/A	57	300.09	
Emotion (D)	4	58,004.34	57.42***
A x D	8	2,460.36	2.44*
SD/A	228	1,010.24	
B x D	4	4,037.50	7.83***
A x B x D	8	1,112.16	2.16*
SBD/A	228	515.75	
C x D	4	2,298.30	4.36**
A x C x D	8	1,051.76	2.00
SCD/A	228	526.49	
B x C x D	4	13,702.93	23.72***
A x B x C x D	8	914.00	1.58
SBCD/A	228	577.57	

*$p < .05$.

**$p < .01$.

***$p < .001$.

Table 2

Facial Channel Accuracy as a Function of Encoders' Sex and Physical Attractiveness

	Sex of encoders	
Physical attractiveness	Male	Female
High attractiveness	40.92_a	63.03_b
Low attractiveness	43.63_a	$47.[illegible]_c$

Note. Means sharing similar subscripts are not significantly different at .05 (HSD).

sex of encoder, F (2, 51) = 76.29, $p < .001$ and F (1, 57) = 82.82, $p < .01$, respectively. The interaction between sex of encoder and intensity of emotion was also significant, F (2,57) = 4.59, $p < .05$. Table 3 indicates that consistent with past research, females were more accurate as encoders than males. The interaction further indicates that the sex difference was true for slight and moderate intensity levels, but not for extreme intensity in males. Males were as accurate as females in encoding extreme levels of emotions. This indicates that males are not inferior at encoding emotions because of lack of knowledge regarding the appropriate cues, but because of the lower intensity in the expression of these emotions.

Vocal Channel Accuracy

A preliminary analysis of variance again indicated that sex of decoder was not a significant variable in the design. Therefore, a 3 x 2 x 2 x 5 mixed analysis of variance was performed on the vocal accuracy data. Although results in Table 4 indicate no main effect for physical attractiveness, there was a significant interaction between physical attractiveness and sex of encoder, F (1, 51) = 5.57, $p < .05$. Table 5 indicates that results for the vocal channel accuracy paralleled those obtained for the facial channel: High attractive female stimulus persons were decoded more accurately than low attractive females. For the male encoders there was no difference in accuracy as a function of physical attractiveness. Physical attractiveness of encoders also interacted with intensity of emotion, F (2, 51) = 7.28, $p < .05$. High attractive encoders were significantly more accurate than low attractive encoders for the slight intensity: Although differences were in the predicted direction for moderate

Table 3

Facial Channel Accuracy: Interaction Between Sex of Encoder and Intensity

Intensity of emotion	Sex of encoders	
	Male	Female
Slight	31.47_{a}	47.53_{b}
Moderate	39.21_{c}	55.42_{d}
Extreme	56.18_{de}	63.10_{e}

Note. Means sharing similar subscripts are not significantly different at .05 (HSD).

Table 4

Analysis of Variance for Vocal Channel Accuracy

Source	df	MS	F
Intensity (A)	2	8,106.25	15.11***
S/A	51	536.36	
Sex of encoder (B)	1	14,067.78	32.33***
A x B	2	3,446.48	7.92**
SB/A	51	435.10	
Physical attractiveness (C)	1	1,096.39	1.93
A x C	2	4,141.24	7.28**
SC/A	51	568.65	
B x C	1	1,771.77	5.57*
A x B x C	2	1,202.15	3.78*
SBC/A	51	317.95	
Emotion (D)	4	41,228.36	75.24***
A x D	8	1,289.42	2.35*
SD/A	204	547.95	
B x D	4	1,150.24	2.58*
A x B x D	8	1,542.67	3.46**
SBD/A	204	445.52	
C x D	4	8.108.52	16.10**
A x C x D	8	1,175.18	2.33*
SCD/A	204	503.62	
B x C x D	4	11,936.30	29.75**
A x B x C x D	8	1,264.40	3.15**
SBCD/A	204	401.17	

*$p < .05$.

**$p < .01$.

***$p < .001$.

Table 5

Vocal Channel Accuracy as a Function of Encoders' Sex and Physical Attractiveness

Physical attractiveness	Sex of encoders	
	Male	Female
High attractiveness	37.53_{a}	47.31_{b}
Low attractiveness	38.07_{a}	42.73_{c}

Note. Means sharing similar subscripts are not significantly different at .05 (HSD).

and extreme intensities, results were not statistically significant. A higher order interaction involving physical attractiveness x intensity of emotion x sex of encoder indicated, however, that only female encoders exhibited this pattern. For male encoders, physical attractiveness resulted in significant differences in accuracy at extreme but not moderate or slight intensity levels. In contrast to females, the high attractive males were less accurate than low attractive males at the extreme intensity. Finally, the four-way interaction was significant, F (8, 204) = 3.15, $p < .05$, indicating that, similar to results for the facial channel, the attractiveness effect depended upon the specific emotion being encoded. This interaction is not readily interpretable due to its complexity.

Finally, a number of other interesting effects were obtained. In addition to main effects for sex of encoder and intensity of emotion, a significant interaction was found between sex and intensity, F (1, 51) = 7.92, $p < .01$. Table 6 indicates that for the vocal channel, as well as for the facial channel, females were more accurate at encoding than were males. The interaction between sex and intensity showed that the sex difference was significant for moderate and extreme but not for slight intensity. Although females showed increasing accuracy with increasing intensity of emotion, males showed no increase in accuracy from slight to moderate to extreme intensity.

Discussion

The present study provided support for the hypothesis that physically attractive individuals would be more accurate as encoders of nonverbal be-

Table 6

Vocal Channel Accuracy: Interaction Between Sex of Encoder and Intensity

Intensity of emotion	Sex of encoders	
	Male	Female
Slight	37.42_{a}	37.50_{a}
Moderate	34.86_{a}	45.33_{b}
Extreme	41.12_{ab}	52.22_{c}

Note. Means sharing similar subscripts are not significantly different at .05 (HSD).

havior. These results were consistent across two nonverbal channels--the facial and the vocal. An unexpected interaction between sex of encoder and physical attractiveness was obtained, however, for both nonverbal channels. The interaction indicated that a relation between physical attractiveness and encoding ability existed for female but not male encoders. High and low attractive males did not differ in their ability to accurately encode facial and vocal expressions of emotion.

The sex difference obtained in the present study is consistent with previous research. This suggests that physical attractiveness exerts less influence on males than on females. Berscheid, Dion, Walster, and Walster (1971) and Walster et al. (1966) found higher correlations between popularity and physical attractiveness for females than for males. In addition, Lerner and Karabenick (1974) found that the correlation between positive self-concept and physical attractiveness was greater for females than males. But one study (Adams, 1977) has reported equally high correlations for males and females. Evidence for the great emphasis on physical attractiveness for females is apparent in the multimillion dollar cosmetic industry in this country. For females, then, interpersonal interaction may be more influenced by physical attractiveness than is the case for males. The predicted superiority of nonverbal skills for attractive rather than for unattractive women--and no difference for men--is consistent with these observations.

One possible criticism of the present study is that differences in encoding accuracy actually may be a decoder effect. Decoders may simply attend more to high than to low attractive encoders. This would result

in higher communication accuracy for the attractive versus the unattractive encoders. The results obtained for the vocal channel, however, argue strongly against this interpretation. The same effect for physical attractiveness was found for the vocal channel where decoders were unaware of the encoder's physical attractiveness.

The present study points to greater social skills for physically attractive rather than unattractive females. Only one social skill (encoding ability) was investigated in the present study. Future research should investigate the relation between physical attractiveness and the ability to decode nonverbal behavior. Another skill to examine in future studies is the ability to present attitudes that may be inconsistent with one's internal cognitions. This behavior requires skills at encoding nonverbal cues to avoid detection of deception.

Finally, future research should test the underlying assumptions for the present study. Although evidence does show that physically attractive individuals are more popular, there is no research to indicate that these individuals actually spend greater time in social interaction. We also suggested that the quality of interpersonal interaction for the physically attractive may be more conducive to the learning of nonverbal skills. Snyder et al. (1977) found that observers' ratings of interaction quality did differ as a function of the perceivers' perceptions of the target person's physical attractiveness. We speculated earlier that other persons may behave in such a way as to elicit more expressive behavior in interacting with those who are physically attractive as compared to unattractive. The difference in interaction patterns was proposed as a

mechanism for providing the physically attractive with greater opportunity to develop nonverbal encoding skills. The study by Snyder et al. did not examine nonverbal behavior. Future research should test the hypothesis that individuals will be more expressive nonverbally when interacting with people who believe them to be physically attractive. In addition, we suggested that physically attractive persons may elicit more nonverbal reactions from others than the physically unattractive. Consistent with this idea, Kleck and Rubenstein (1975) did find differences in gazing and smiling as a function of confederate attractiveness. Future research should examine a person's nonverbal expressiveness (multiple cues) in interaction as a function of the physical attractiveness of the other person.

The exact mechanism for the greater nonverbal social skills by the physically attractive than unattractive females was not discussed in the present study. The strong relationship obtained between physical attractiveness and encoding ability suggests that important differences may have existed in the social environment of physically attractive and physically unattractive individuals during the socialization period.

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